



# OPENED SEPTEMBER 2020 ENGINEERING AND CREATIVE AND DIGITAL

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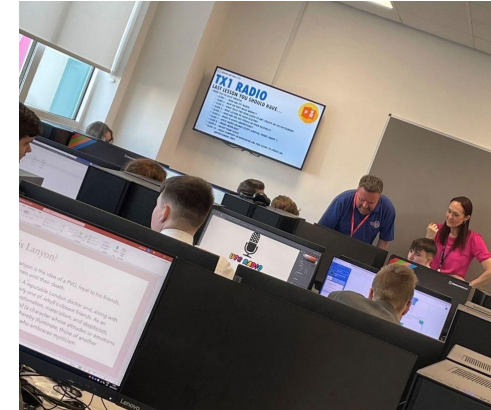




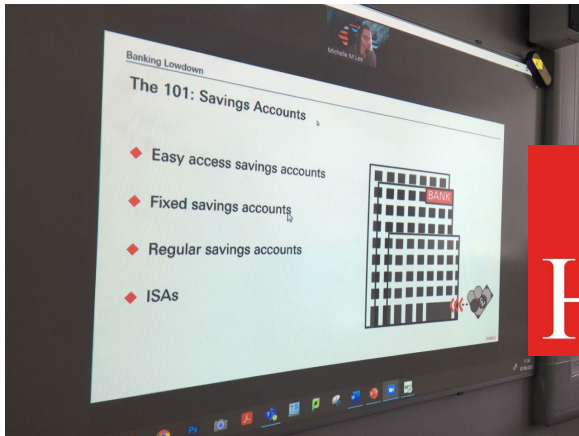
KS4		
EM	R015: Manufacturing a one-off product	This is assessed by a set assignment. In this unit you will learn how to safely plan and produce a one-off product by using appropriate processes, tools and equipment. Topics include: o Planning the production of a one-off product o Measuring and marking out o Safely use processes, tools and equipment to make a product
	R016: Manufacturing in quantity	This is assessed by a set assignment. In this unit you will learn how to manufacture using simple jigs and templates to support manufacturing in volume using Computer Aided Design (CAD) software and Computer Numerical Control (CNC) equipment. Topics include: o Preparing for manufacture o Develop programmes to operate CNC equipment o Safely use processes and equipment to make products in quantity
	R014: Principles of engineering manufacture	This is assessed by an exam. In this unit you will learn about the different types of manufacturing processes, and the different materials that can be used within manufacturing. Topics include: o Manufacturing processes o Engineering materials o Manufacturing requirements o Developments in engineering manufacture.
ED	R039: Communicating designs	This is assessed by a set assignment. In this unit you will learn how to use sketching and engineering drawings to communicate your ideas. Topics include: o Manual production of freehand sketches o Manual production of engineering drawings o Use of computer aided design (CAD)
	R040: Design, evaluation and modelling	This is assessed by a set assignment. In this unit you will learn how to create and test models of your design. Topics include: o Product evaluation o Modelling design ideas
	R038: Principles of engineering design	This is assessed by an exam. In this unit you will learn about the design process, and all of the stages that are involved. Topics include: o Designing processes o Designing requirements o Communicating design outcomes o Evaluating design ideas
Sys	R048: Making and testing electronic circuits	This is assessed by a set assignment. In this unit you will learn how to use Computer Aided Design (CAD) software to simulate electronic circuits, as well as how to construct and test them. Topics include: o Drawing and simulating electronic circuits o Constructing electronic circuits o Testing electronic circuits
	R049: Developing programmable systems	This is assessed by a set assignment. In this unit you will learn how to determine hardware and system requirements to meet a given brief, and select appropriate input and output devices. Topics include: o Plan the development of programmable systems o Develop programmable systems o Test programmable systems
	R047: Principles of electronic and programmable Systems	This is assessed by an exam. In this unit you will learn about the relationships between voltage, current, resistance and power, and the ways in which systems are represented, tested and assembled. Topics include: o Basic electronic circuit principles o Electronic and programmable systems, components and devices o Methods of prototyping and testing systems and circuits o Commercial circuit production and construction methods.


Unit no	Engineering Unit	Project Brief - Scenario
1	MFE	Learners should study the design requirements, influences and user needs within the taught content in the
		Use Science in context to solve Engineering problems. Learners should study the design requirements, influences and user needs within the taught content in the context of a range of real engineered products. During the external assessment, learners will be expected to demonstrate their understanding through questions
2	SFE	that require the skills of analysis and evaluation in particular contexts
3	PME	and user needs within the taught content in the context of a range of real engineered
4	EEE	influences and user needs within the taught content in the context of a range of real engineered
10	CAD	standard CAD equipment and design standards, to determine if the students'
9	Mech Design	using industry standard equipment and standards, written to
11	Material Science	selected for the product are capable of manufacture and meet customer specifications/requirements. • A local
13	Mech Ops	Task set on the measurement and inspection of components using industry standard equipment, to determine if a planned production method meets the required industrial standard.
18	Lean & Quality	Engineering employers set productivity improvement challenges where students have to take an existing process and apply lean and quality tools and techniques to improve its performance.
19	Testing and Inspection	and production method is fit for purpose. (could involve PPAP and SPC run charts)
21	Maintenance	Measure and inspection of production equipment/tooling, using industry standard equipment, to determine if the production equipment requires maintenance interventions.
22	Engineering and the environment	Employers set energy efficiency challenges where students have to carry out an energy assessment of part of the site and suggest ways of improving energy efficiency.












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# COMPUTING AND IT SKILLS PASSPORT.

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## Manual Centre Lathe



Linked Employers
Cross Curricular Link

Employer Feedback

Level	Descriptor	Key Skills	Stamp
Emerging	I can accurately set up the machine and ensure that the tools are correct set up and secured. I can measure a piece of material and accurately face off and turn down the piece	<ul style="list-style-type: none"> <li>PPE</li> <li>Setup</li> <li>Tooling</li> <li>Facing off</li> <li>Turning down</li> </ul>	
Secure	I can competently and accurately measure a piece of metal and turn down to a given tolerance. I can set up the tail stock on the lathe to hold a center drill and a drill. I can then center drill and drill holes using the peck drilling method.	<ul style="list-style-type: none"> <li>Measuring</li> <li>Turning down</li> <li>Making items to a tolerance of +/- 0.5mm</li> <li>Centre drilling</li> <li>Drilling</li> </ul>	
Embedded	I can show confidence and independence when working on the lathe. I can use cutting tools and parting tools to create more complex shapes and demonstrate high level skills. I can accurately use engineering drawings to follow a plan and make a product on the lathe. I have demonstrated with support to other students in my class. I can use and apply new skills like creating threads, knurling, tapping and cutting tapered ends.	<ul style="list-style-type: none"> <li>Making items to a tolerance of +/- 0.2mm</li> <li>Turning</li> <li>Threading</li> <li>Tapping</li> <li>Knurling</li> <li>Tapering</li> </ul>	
Ambassador	I am confident with being able to demonstrate and guide other students in my class on how to use the lathe and how to set it up. I show innovative and creative skills when operating the machine and in problem solving when things go wrong. I demonstrate and teach others how to use and apply new skills like creating threads, knurling, tapping and cutting tapered ends.	<ul style="list-style-type: none"> <li>Making items to a tolerance of +/- 0.1mm</li> <li>Threading</li> <li>Tapping</li> <li>Knurling</li> <li>Tapering</li> </ul>	





## Working together:

- Tailoring elements of our curriculum to suit the skills needed for this project
- Educating our students on the technologies of the future, and the opportunities they bring
- Workplace visits to help them understand the sector in greater depth
- Assisting with our delivery through our Employer Advisory Committee or staff development programmes